

We claim:

1. An optical arrangement, comprising:
 - a light source that emits radiation,
 - a mount,
 - an optical element fastened in said mount,
wherein said optical element is acted on by said radiation such that a heat supply results from said radiation that lacks symmetry corresponding to the shape of said optical element, and
 - a connecting structure between said optical element and said mount, having a symmetry characteristic that does not correspond to the shape of the optical element.
2. An optical arrangement, comprising:
 - a light source that emits radiation,
 - a mount,
 - an optical element fastened in said mount,
wherein said optical element is acted on by said radiation such that heat that results from said radiation lacks symmetry corresponding to the shape of said optical element, and
 - a single- or multi-part thermally conducting element arranged in operative connection with said optical element and said mount and having a form of heat transport that effects an at least partial compensation of the asymmetry of temperature distribution in said optical element.
3. A projection exposure system for microlithography, comprising:

an optical element that is heated by radiation in a manner that lacks rotational symmetry, and

a cooling system for said optical element that lacks rotational symmetry, said cooling system including passive thermally conducting devices that effect cooling.

4. A projection exposure system for microlithography, comprising
an optical element that is heated by radiation in a manner that lacks rotational symmetry, and
at least one passively thermally conducting part arranged in thermal contact with said optical element, which part covers a portion of the cross section of said optical element which is not exposed to said radiation, and which part reduces temperature gradients in said optical element.
5. The optical arrangement according to claim 1, in which said optical element comprises a transmitting element.
6. The optical arrangement according to claim 5, in which said transmitting element comprises a lens.
7. The optical arrangement according to claim 2, in which said optical element comprises a transmitting element.
8. The optical arrangement according to claim 7, in which said transmitting element comprises a lens.
9. The projection exposure system according to claim 3, in which said optical element comprises a transmitting element.
10. The projection exposure system according to claim 9, in which said transmitting element comprises a lens.

11. The projection exposure system according to claim 4, in which said optical element comprises a transmitting element.
12. The projection exposure system according to claim 11, in which said transmitting element comprises a lens.
13. The optical arrangement according to claim 1, in which said optical element comprises a mirror.
14. The optical arrangement according to claim 2, in which said optical element comprises a mirror.
15. The projection exposure system according to claim 3, in which said optical element comprises a mirror.
16. The projection exposure system according to claim 4, in which said optical element comprises a mirror.
17. The optical arrangement according to claim 1, having a slit-shaped image field.
18. The optical arrangement according to claim 2, having a slit-shaped image field.
19. The projection exposure system according to claim 3, having a slit-shaped image field.
20. The projection exposure system according to claim 4, having a slit-shaped image field.
21. The optical arrangement according to claim 5, in which said optical element is arranged near a field plane.
22. The optical arrangement according to claim 7, in which said optical element is arranged near a field plane.
23. The projection exposure system according to claim 9, in which said optical

element is arranged near a field plane.

24. The projection exposure system according to claim 11, in which said optical element is arranged near a field plane.
25. The optical arrangement according to claim 1, further comprising a reticle, the illumination of which lacks rotational symmetry.
26. The optical arrangement according to claim 25, in which said reticle illumination consists of off-axis, dipole or quadrupole illumination type.
27. The optical arrangement according to claim 2, further comprising a reticle, the illumination of which lacks rotational symmetry.
28. The optical arrangement according to claim 27, in which said reticle illumination consists of off-axis, dipole or quadrupole illumination type.
29. The projection exposure system according claim 3, further comprising a reticle, the illumination of which lacks rotational symmetry.
30. The projection exposure system according to claim 29, in which said reticle illumination consists of off-axis, dipole or quadrupole illumination type.
31. The projection exposure system according to claim 29, in which said optical element is arranged near a pupil plane.
32. The projection exposure system according to claim 4, further comprising a reticle, the illumination of which lacks rotational symmetry.
33. The projection exposure system according to claim 32, in which said reticle illumination consists of off-axis, dipole or quadrupole illumination type.
34. The projection exposure system according to claim 32, in which said optical element is arranged near a pupil plane.

35. The optical arrangement according to claim 1, in which said connecting structure comprises portions of different materials.
36. An optical arrangement comprising:
 - a light source that emits radiation,
 - a mount,
 - an optical element fastened to said mount,
wherein said optical element is acted on by said radiation such that heat that results from said radiation lacks symmetry corresponding to the shape of said optical element, and
 - a single- or multi-part passive thermally conducting element arranged in operative connection with said optical element and said mount and having a form of heat transport that effects an at least partial compensation of the asymmetry of temperature distribution in said optical element,
wherein said passive thermally conducting element comprises an assembly of portions of different material.
37. A projection exposure system for microlithography, comprising:
 - an optical element that is heated by radiation in a manner that lacks rotational symmetry, and
 - a cooling system for said optical element that lacks rotational symmetry, said cooling system including passive thermally conducting devices that effect cooling,
wherein said passive thermally conducting devices comprise portions of different material.
38. The projection exposure system according to claim 4, in which said at least one

part of a thermal conductor in thermal contact with said optical element comprises a plurality of different materials.

39. The optical arrangement according to claim 1, in which said connecting structure comprises adjustable portions.
40. The optical arrangement according to claim 2, in which said thermally conducting element is adjustable.
41. The projection exposure system according to claim 3, in which said thermally conducting elements comprise adjustable portions.
42. The projection exposure system according to claim 4, in which said at least one part of a thermal conductor in thermal contact with said optical element is at least partially adjustable.
43. An optical arrangement, comprising:
 - a light source,
 - at least one optical element, and
 - a passive compensator of thermal effects caused by radiation from said light source, which compensator lacks rotational symmetry.
44. A projection exposure system for microlithography, comprising:
 - an optical element that is heated by radiation in a manner that lacks rotational symmetry, and
 - a cooling system that lacks rotational symmetry for said optical element, said cooling system comprising passive thermally conducting devices.
45. An optical arrangement, comprising:
 - a light source that emits radiation,

a mount,

an optical element fastened in said mount,

wherein said optical element is acted on by said radiation such that a heat supply results from said radiation that lacks symmetry corresponding to the shape of said optical element, and

a connecting structure between said mount and said optical element , having a symmetry characteristic that substantially does not correspond to the shape of the optical element.

46. An optical arrangement, comprising:

a light source that emits radiation,

a mount,

an optical element fastened in said mount,

wherein said optical element is acted on by said radiation such that heat that results from said radiation lacks symmetry corresponding to the shape of said optical element, and

a single- or multi-part thermally conducting element arranged in operative connection with said optical element and said mount and having a form of heat transport that effects an at least partial compensation of the asymmetry of temperature distribution in said optical element.

47. A projection exposure system for microlithography, comprising:

an optical element that is heated by radiation in a manner that lacks rotational symmetry, and

a cooling system for said optical element that lacks rotational symmetry, said

cooling system including passive thermally conducting elements that effect cooling, in which said thermally conducting elements comprise adjustable portions.

48. A projection exposure system for microlithography, comprising an optical element that is heated by radiation in a manner that lacks rotational symmetry, and at least one passive thermally conducting part arranged in thermal contact with said optical element, which part covers a portion of the cross section of said optical element which is not exposed to said radiation, and which part reduces temperature gradients in said optical element, in which said at least one passive thermally conducting part of a thermal conductor in thermal contact with said optical element comprises a plurality of different materials and in which said at least one passive thermally conducting part of a thermal conductor in thermal contact with said optical element is at least partially adjustable.

49. The optical arrangement according to claim 80, in which said optical element comprises a transmitting element.

50. The optical arrangement according to claim 49, in which said transmitting element comprises a lens.

51. The optical arrangement according to claim 88, in which said optical element comprises a transmitting element.

52. The optical arrangement according to claim 51, in which said transmitting element comprises a lens.

53. The projection exposure system according to claim 48, in which said optical

element comprises a transmitting element.

54. The projection exposure system according to claim 53, in which said transmitting element comprises a lens.
55. The projection exposure system according to claim 84, in which said optical element comprises a transmitting element.
56. The projection exposure system according to claim 55, in which said transmitting element comprises a lens.
57. The optical arrangement according to claim 80, in which said optical element comprises a mirror.
58. The optical arrangement according to claim 88, in which said optical element comprises a mirror.
59. The projection exposure system according to claim 48, in which said optical element comprises a mirror.
60. The projection exposure system according to claim 84, in which said optical element comprises a mirror.
61. The optical arrangement according to claim 80, having a slit-shaped image field.
62. The optical arrangement according to claim 88, having a slit-shaped image field.
63. The projection exposure system according to claim 48, having a slit-shaped image field.
64. The projection exposure system according to claim 84, having a slit-shaped image field.
65. The optical arrangement according to claim 80, in which said optical element is arranged near a field plane.

66. The optical arrangement according to claim 65, in which said optical element is arranged near a field plane.
67. The projection exposure system according to claim 48, in which said optical element is arranged near a field plane.
68. The projection exposure system according to claim 84, in which said optical element is arranged near a field plane.
69. The optical arrangement according to claim 80, further comprising a reticle, the illumination of which lacks rotational symmetry.
70. The optical arrangement according to claim 69, in which said reticle illumination consists of off-axis, dipole or quadrupole illumination.
71. The optical arrangement according to claim 88, further comprising a reticle, the illumination of which lacks rotational symmetry.
72. The optical arrangement according to claim 71, in which said reticle illumination consists of off-axis, dipole or quadrupole illumination type.
73. The projection exposure system according to claim 48, further comprising a reticle, the illumination of which lacks rotational symmetry.
74. The projection exposure system according to claim 73, in which said reticle illumination consists of off-axis, dipole or quadrupole illumination type.
75. The projection exposure system according to claim 48, in which said optical element is arranged near a pupil plane.
76. The projection exposure system according to claim 84, further comprising a reticle, the illumination of which lacks rotational symmetry.
77. The projection exposure system according to claim 76, in which said reticle

illumination consists of off-axis, dipole or quadrupole illumination type.

78. The projection exposure system according to claim 84, in which said optical element is arranged near a pupil plane.
79. The optical arrangement according to claim 88, in which said connecting structure comprises portions of different materials.
80. An optical arrangement comprising:
 - a light source that emits radiation,
 - a mount,
 - an optical element fastened to said mount,
wherein said optical element is acted on by said radiation such that heat that results from said radiation lacks symmetry corresponding to the shape of said optical element, and
 - a single- or multi-part passive thermally conducting element arranged in operative connection with said optical element and said mount and having a form of heat transport that effects an at least partial compensation of the asymmetry of temperature distribution in said optical element,
wherein said passive thermally conducting element comprises an assembly of portions of different material.

81. The optical arrangement according to claim 80, in which said connecting structure comprises adjustable portions.
82. The optical arrangement according to claim 84, in which said thermally conducting element is adjustable.
83. The projection exposure system according to claim 84, in which said thermally

conducting elements comprise adjustable portions.

84. A projection exposure system comprising:
an optical element that is heated by radiation in a manner that lacks rotational symmetry, and
a cooling system for said optical element that lacks rotational symmetry, said cooling system including passive thermally conducting devices that effect cooling, wherein said passive thermally conducting devices comprise portions of different material.

85. A reflective mirror for use in an optical system, the mirror comprising
a mirror body defining a mirror surface,
an illuminated region of the mirror surface, and
at least one thermally conducting element attached to the mirror outside the illuminated region, the thermally conducting element having flexibility and forming a heat conducting connection away from the mirror.

86. The reflective mirror according to claim 85, wherein the thermally conducting element has a cable - like or longitudinally extended configuration.

87. The reflective mirror according to claim 85, wherein the mirror body has a shape, and the at least one thermally conducting element has a symmetry characteristic that does not correspond to said shape.

88. An optical arrangement, comprising
a mount,
an optical element fastened in the mount,
an additional flexible thermal conductor at said optical element.

89. An optical arrangement according to claim 88, wherein said optical element is selected from a group consisting of mirrors, lenses, prisms and transmitting elements.
90. An optical arrangement according to claim 80, wherein said optical element is selected from a group consisting of mirrors, lenses, prisms and transmitting elements.